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BRAMPTON CHINGUACOUSY

SEWAGE TREATMENT PLANT

ANNUAL REPORT

1960

PREPARED BY

THE DIVISION OF PLANT OPERATIONS

ONTARIO WATER RESOURCES COMMISSION

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Brampton sewage treatment
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BRAMPTON SEWAGE TREATMENT PLANT

INTRODUCTION

On June 18, 1958, the Ontario Water Resources Commission issued its Certificate of Approval for the construction of an activated sludge sewage treatment plant having a capacity of 1,000,000 gallons per day and consisting of comminution, grit removal, primary and secondary sedimentation, aeration, heated sludge digestion and chlorination of effluent. The contract for the construction of this treatment plant was awarded to Andeen Construction Company at a cost of \$324,973.00. Also, included in the project was a sanitary trunk sewer. The contract for this was awarded to Robinson Contracting Company at a price of \$374,000.00.

DESIGN DATA

The dry weather flow, for which the plant is designed, is one million gallons per day, or for a population of 10,000 at 100 gallons per capita per day. The average daily flow, as this report is prepared, fluctuates between 650,000 and 700,000 gallons per day. The peak flow, or flows, recorded at periods of maximum flow, reach 1,000,000 gallons per day mark and better, on occasion.

DESCRIPTION OF OPERATION

The sewage flows to the sewage treatment plant through a trunk sewer, varying from 36 inches to 42 inches in diameter, and a 10 inch to 27 inch diameter force main from the Bramalea pumping station. The construction of yet another trunk sewer has started. This is to carry the sewage from the existing pumping station on the east side of Brampton to the OWRC sewage treatment plant.

From the influent chamber the sewage passes through a Chicago Pump Company Model "B" Barminuter to the aerated grit removal chamber. Here the grit and sand are removed to the bottom of the chamber and air-lifted

to the grit hopper for removal with a wheel barrow.

The raw sewage enters the primary clarifier where it is retained for approximately $1\frac{1}{2}$ hours before passing to the aeration tanks. During the detention time in the primary clarifier, the solids settle to the bottom of the tank and are pumped to the digester. The effluent passes over weirs to the aeration tanks.

In the two aeration tanks, with activated sludge returned from the final clarifier, the mixture (mixed liquor) is aerated with compressed air for approximately 6 hours. When the mixed liquor is aerated for a period of time, the suspended particles, colloidal particles, and dissolved material, will coalesce to form a light feathery flock which readily settles under quiescent conditions. This takes place in the secondary clarifier where the floc settles to the bottom and the effluent passes over the weirs and on to the chlorine chamber.

Chlorine, for disinfection is added to the effluent in the contact chamber before it is discharged to Etobicoke Creek.

The sludge that is pumped to the digester is kept at 90° F and is periodically thoroughly mixed. The sludge is broken down in the digester by bacterial action to a thick, black odorless liquid. Sludge gas formed during the process is used as fuel to heat the digester and control building. The digested sludge is run onto sand drying beds, and is eventually trucked away.

The Bramalea pumping station is located in the Township of Chinguacousy serving the Bramalea Subdivision. It consists of two 1 mgd centrifugal pumps with Cummins diesel stand-by engine. A Chicago Pump Company Model "B" Barminutor is provided ahead of the sewage pumps.

OPERATING DETAILS

The sewage treatment plant was put into operation on January 21, 1960.

Considerable difficulty was experienced in the initial operation of the plant.


When the sewage was first directed to the new treatment plant, large quantities of mud and silt were received in the plant. This hampered operations and the removal of the mud and silt was time consuming.

From January 26 to February 18, 1960, inclusive, all sewage from the Town of Brampton was discharged to the OWRC plant. During this period, accumulations of sludge were flushed from the main treatment units at the old plant to the OWRC plant. This material resettled in the OWRC plant treatment units and created a real problem. Its final removal was hampered by the malfunction of some of the new equipment.

A sudden thaw on the afternoon of Sunday, March 27, 1960 created high flows at the plant. An effort was made to control the flow so that 5 million gallons per day, by the flow meter, passed through the inlet works of the plant, while the remainder was by-passed directly to Etobicoke Creek. This situation was aggravated by the fact that all the sewage flow to the old Brampton sewage plant was directed to the OWRC plant in order to repair the flow meter at the old treatment plant.

The operation of the plant has also been hampered by certain industrial wastes arriving at the treatment plant. Initiated by this Division, an investigation was launched by the Industrial Waste Branch of the Ontario Water Resources Commission on May 24, 1960 into the source of feathers and grease. The investigation was directed at Brampton Poultry Company Limited. Even though the alterations at the poultry company may not be completed, the poultry wastes seemed to have improved considerably.

Another industrial waste that is hampering the operation of the sewage treatment considerably is chrome. On several occasions, an orange-yellow colour has appeared in the sewage which was analyzed and identified as



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chrome. The considered safe limit for chrome in raw sewage is only 5 ppm. On July 22, 1960, a raw sewage sample was tested and contained 600 ppm of chrome, all in the hexavalent form. The chrome contamination in the plant continued until Monday, July 25, 1960.

Chrome affects the biological processes and nitrification in the aeration tanks. Every effort should be made to eliminate this intermittent discharge of chrome to the sewer system.

Considerable difficulties were encountered in the operation of the original Wemco pumps in pumping raw sludge to the digester. The pumps would not operate continuously over the range of head required to pump from the bottom to the top of the digester. After some time, the pumps were replaced by Carter sludge pumps.

It was discovered after considerable operating difficulty that the mechanism in the primary clarifier was not properly fabricated or installed. As this report is being written, corrective measures are about to begin.

Six maintenance inspections were given the equipment during the past year by our maintenance forces plus numerous visits by the project engineer in charge of the project.

RESEARCH

The research work at the Brampton sewage treatment plant consisted of a study to determine the use of a microstrainer in polishing sewage plant effluents. An extensive sampling program was carried out with both composite and grab samples being taken for chemical analyses. The average BOD reduction in the effluent was 51%, while the average suspended solids reduction was slightly greater - 55% reduction.

PERSONNEL

R. L. Church was born in Toronto and moved to Brampton after the war. His work activities since leaving school include tool and die making, machinist, process planner and aero engine mechanic.

During the war, Mr. Church served in R.C.A.F. as an aero engine mechanic. Formerly with Orenda Engines in Malton, he joined the Commission staff in June, 1958.

CHIEF OPERATOR

BRAMPTON SEWAGE TREATMENT PLANT

He is a member of the Board of Directors of the Malton Jet Power Credit Union. Among his hobbies he lists hockey, football, fishing and gardening. His wife's name is Bernice. There are three children, Guy-11, Janice-7, and Jane-4.

T. Gregory was born in Marysville, N.B., and moved to Toronto a few years ago. He has worked at lumbering and textiles. Mr. Gregory played semi-pro ball for a couple of years for Orono, Maine, Papermakers as a catcher. Among his hobbies and interests he lists hunting, fishing, baseball, gardening, bowling, and

OPERATOR

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a keen interest in photography. He has a wide variety of cameras and equipment. While in Marysville, he served for 8 years on the Town Council on parks, roads and finance committees. He joined the Commission staff last January. His wife's name is Evelyn.

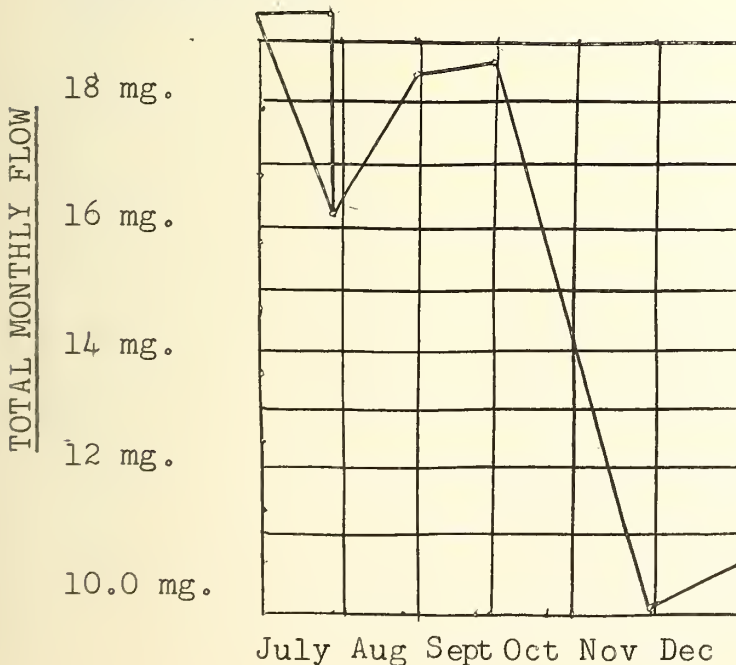
A. Friesen was born in Laird, Saskatchewan, later moved to Timmins and then moved to Huttonville upon joining the Commission staff last April. During the war he joined the Ontario Tank Regiment and went overseas with the 1st Canadian Tank Brigade seeing service in North Africa, Italy and England.

OPERATOR

BRAMPTON SEWAGE TREATMENT PLANT

He lists bowling, hockey and gardening as his main interests. He played hockey in a commercial league in Timmins. Wife's name is Elsa. They have two children.

OPERATING COST



The total operating cost of the project during the year of 1960 was \$19,322.14. This was for a period of approximately eleven months. Statistics have been gathered as of July 1. Since July 1, 1960, 93,579,000 gallons have been treated at a cost of 12,437.14 or 13.2 cents per thousand gallons.

ESTIMATED COST FOR 1961

PAYROLL	\$12,400
FUEL	1,250
POWER	3,600
CHEMICALS	1,400
GEN. SUPP.	320
EQUIPMENT	500
M. & R.	850
MISCELLANEOUS	<u>500</u>
	20,820
CONTINGENCY	<u>2,000</u>
	\$22,820

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